Implementation Process for ESTO Technology Investment Studies

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Goals of the Study Effort

To "Maintain a traceable link between science and applications objectives and technology investment"

- Help develop a rationale for ESTO investment decisions
  - provide objective answers to specific technology issues and questions
  - provide information that supports decision-making
- Develop a "corporate" knowledge base that
  - helps us improve future study efforts
  - makes study results and recommendations available to the Enterprise

Generation of Study Topics

- Study topics come from:
  - Enterprise (as directed studies)
  - ESTO staff
    - » technology Managers and Integrators
    - » product-line Leads
  - Scientist and Technologist community
    - » through focused informal calls
    - » inputs submitted via ESTO studies Webpage (always open)

Selection of Study Topics

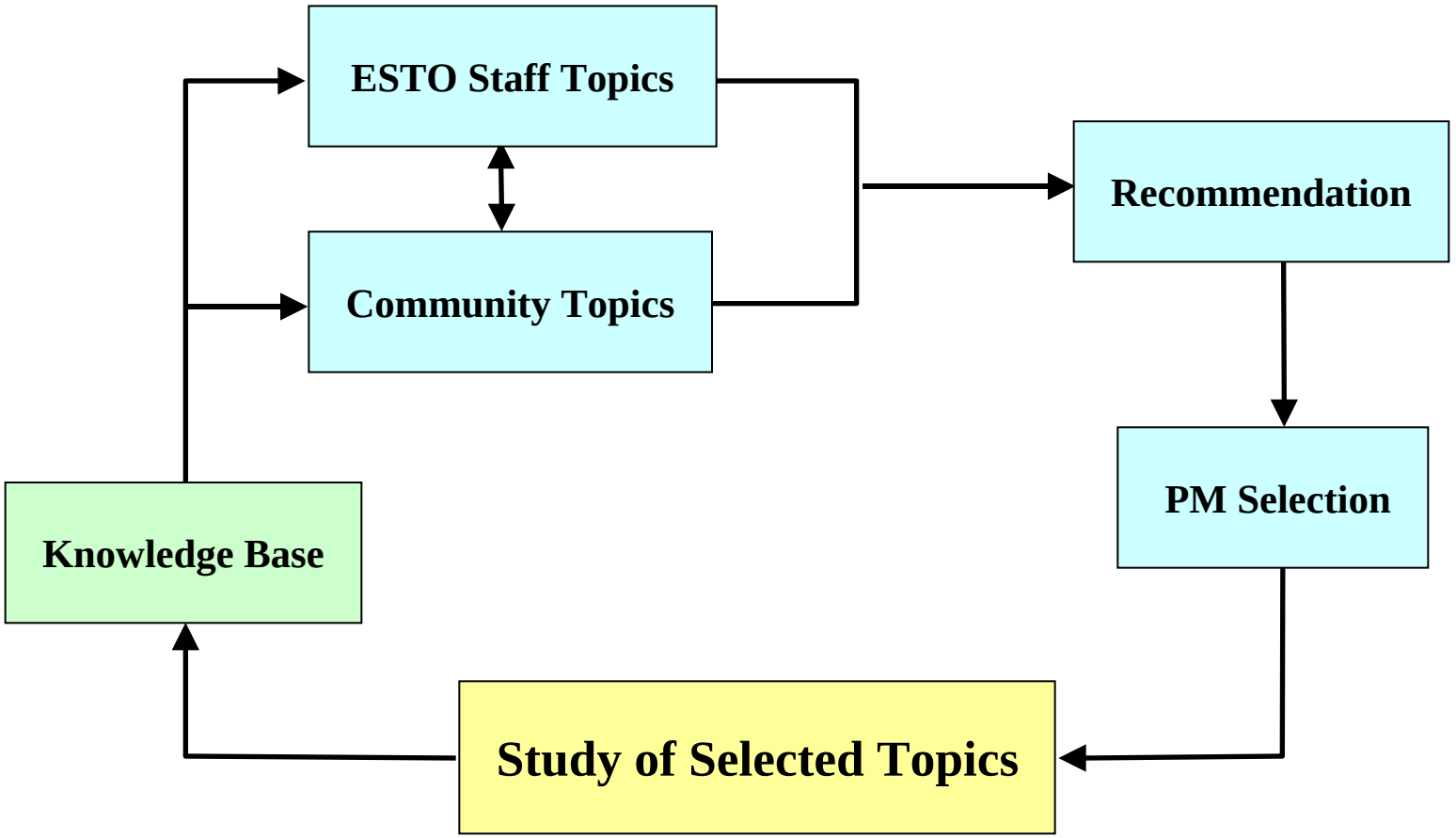
- ESTO staff meets bi-annually to consider candidate topics and develop a studies recommendation

- ESTO Program Manager decides which studies to initiate
  - based on overall priorities and funding
  - certain quick-turnaround studies may bypass this process

Topic Selection Criteria

- Preference given to studies which:
  - have a clear and strong linkage to roadmap-related investment options or to product-line technology needs and priorities
  - provide quantitative figures-of-merit (e.g., payoff) that identify and support specific investment approaches
  - address investment issues that involve:
    - » a variety of ESE measurement sets
    - » more than one product line

Overall Process Flow



How are Studies Conducted?

- Studies are directed to the group or groups with requisite knowledge and experience

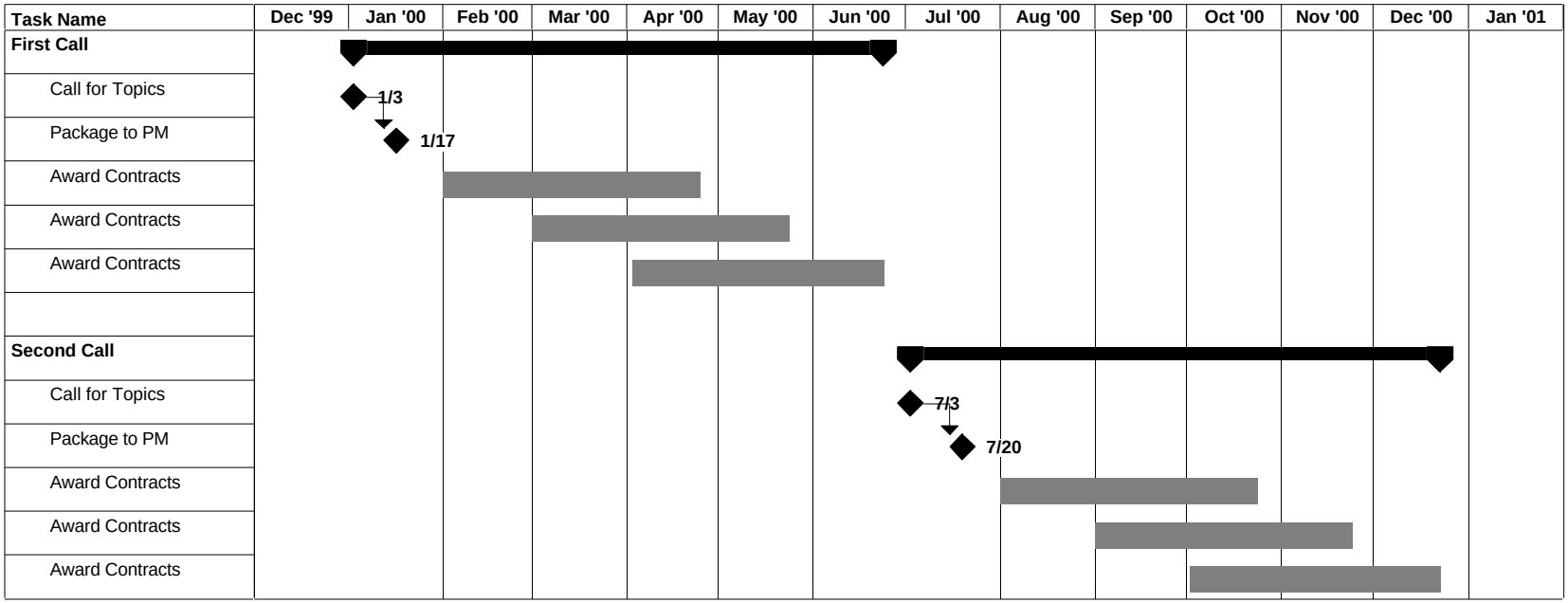
- Several “contracting” mechanisms:
  - charge number for Civil Servants (NASA Centers)
  - task to an existing contract
  - sole-source procurement (small purchase)
  - formal solicitation (RFPs) and competitive procurement
  - response to unsolicited proposals

Dissemination of Study Results

- Establish an ESTO library of study report summaries
  - Adobe.pdf documents accessible via WWW
  - indexed by year, topic, product line, etc. . .
  - excludes costing or proprietary data
  - not open to the general public
    - » access by password only

- Publish a yearly “ESTO studies executive summary”

Process Timeline



Examples of Study Topics

- **Data Processing On-board vs. Ground**

Evaluate Onboard vs. Ground processing and identify technology needs and impact.

- **Spacecraft Technology Infusion**

Work with RAPID II vendors to determine spacecraft technologies they would like to see funded by NASA, and why, and what sort of technology infusion process they envision for these technologies.

- **DIAL Roadmap**

Provide a comprehensive roadmap of technologies required for DIAL measurements of Tropospheric water vapor, ozone, and carbon dioxide.

- **Laser for CO2**

Provide a comprehensive roadmap of technologies required for surface reflection laser measurement of Tropospheric CO2.

- **Advanced Telecom System for Low-Earth Orbiter**

A trade study to evaluate the feasibility of designing more efficient antennas and power amplifiers, and to identify how well these improved components can reduce the mass and power of platform systems.

Examples of Study Topics (continued)

- **10-km Soil Moisture Architecture**

Determine the optimum system configuration necessary to achieve the scientific and retrieval algorithm requirements for a 10-km resolution soil-moisture measurement. Identify sensor options and the technology development needed to realize a viable mission.

- **Polarimetric Radiometry Instrument Design**

A trade study of a polarimetric radiometer design to select the optimal technologies to achieve the necessary level of calibration and stability levels.

- **Phase Correction for Microwave Systems**

Identify and characterize potential new technologies for building large “smart” apertures that autonomously correct aperture distortions.

- **Benefit of Optical Comm-link to NASA's EOS Program**

Follow-on to the 1998 High-data-rate study that was conducted with GSFC focusing on the LEO to GEO optical communications link. Documents ROI on investments in high data rate comm for ESE.

- **Sensor Web**

Identify and examine Earth monitoring applications for sensor webs. (Help develop concepts embedded within the ES vision).

Conclusion (next steps)

- Start with the ~ 50 study topics that resulted from an informal call made last February.
- Clearly articulate and document the topic selection criteria.
- Generate the first recommendation package.
- Make final selections and start running studies!!